United States Department of Agriculture

NRCS Natural Resources Conservation Service

GUIDELINES FOR HERBACEOUS STAND EVALUATION

Indiana - October 2007 (ver. 1.0)

AGRONOMY TECHNICAL NOTE

The success of herbaceous (grasses & legumes) plantings depends on two factors:

1) Are the emerged plants established to the point of long-term survivability?

2) Is the stand adequate (dense enough) for the planned purpose?

Factors affecting establishment:
How rapidly a seeding develops, and the density of the stand, is dependent on several factors: seeding date, weather (temperature and moisture) after seeding, seedbed conditions, fertility, use of mulch, planting depth, seed soil contact, seeding rate, seed quality (germination and % purity), time after seeding, insects and diseases.

Pure stands of grasses and legumes naturally reach a climax density when mature. The final density depends on the management applied to the stand. Stands of most grasses that are mowed 3 to 5 times a year will generally have a higher plant density than a stand that is never mowed or mowed only once a year. Legume stands mowed 2 or 3 times per year are likely to have a higher plant density than when mowed less or more frequently than 2 or 3 times.

Time effects on establishment:
Typically, even with good quality seed, approximately only 50% of planted seeds will germinate. Then, the density will continue to decrease through "survival of the fittest" from competition for space, moisture, sunlight, etc. with the planted species as well as weeds. For example, expect a much higher density of plants 4 to 6 months after seeding than one year after seeding. Likewise, expect fewer plants two years after seeding until the plant population reaches its climax density (usually 2 years for most grass-legume stands).

Determining stand adequacy:
IF STANDS ARE OBVIOUSLY ADEQUATE OR INADEQUATE BY VISUAL OBSERVATION A FORMAL STAND EVALUATION IS NOT NECESSARY. However, if the stand is questionable by visual observation or documentation is required, the following procedures will be used to document the seeding certification as meeting NRCS standards.

Correct plant identification and knowledge of the vegetative characteristics of the planned species is necessary to ensure accuracy http://plants.usda.gov/.

Only those <u>planned</u> plants that are well rooted and properly identified will be counted and used in determining the stand density.

Sampling Method: A one square foot frame is easily constructed with a variety of materials and shapes (= 12 inches x 12 inches). A circular frame will present the least error from edge to area ratio (= 42.5 inch circumference;13.5 inch diameter / 6.8 inch radius).

Indiana eFOTG Standards can be found at http://www.nrcs.usda.gov/technical/efotg/

Sample in a systematic manner beginning with sparse portions of stands. If these areas are adequate then the entire area is considered adequate. Conduct as many counts as needed to give a good representation of the planting. Be sure to check important area such as outlets of water ways or erosive areas. Avoid end rows or turn around areas that may have been double seeded.

If a portion of the field has had a different cropping history, fertilization program or major differences in soil types or slopes, the sampling should be stratified and the average plant densities kept separate for the different areas. Tabular entries should be made after each frame count to ensure accuracy. Initial stand counts should be made before excessive plant growth makes frame alignment and the counting procedure more difficult.

If the stand density is <u>less</u> <u>than</u> the values within the time frames listed in Table 1, the stand is considered inadequate. Inadequate stands may need more time and should be re-evaluated at a later time, and/or management techniques recommended to the producer to ensure the plants become adequately established. If a stand is still inadequate after a reasonable amount of time, then reseeding should be recommended.

If the stand is a mixture of species, all values in Table 1 should be reduced by the ratio of each species planned percentage in the mixture. A sample form is included for your information and use. The stand evaluation worksheet should be used as a management tool as well as a means of documenting stand establishment.

TABLE 1 - PLANTS NEEDED PER SQUARE FOOT AT VARIOUS TIME INTERVALS AFTER PLANTING FOR HERBACEOUS STAND EVALUATION

SPECIES	Critical Areas/WW's			Forage Production			Conservation Cover*		
	6-9 wks	9-52 wks	2 yrs**	6-9 wks	9-52 wks	2 yrs**	6-9 wks	9-52 wks	2 yrs**
Big Bluestem	NA	NA	NA	3	3	1	2	2	1
Indiangrass	NA	NA	NA	3	3	1	2	2	1
Switchgrass	9.0	9	7	3	3	1	2	2	1
Little bluestem	NA	NA	NA	6	6	1	3	3	1
Wheat/rye	28	14	NA	24	12	NA	12	6	NA
Forage Turnip	NA	NA	NA	24	12	NA	12	6	NA
Austrian Winter Pea	NA	NA	NA	7	3	NA	3	2	NA
Kentucky bluegrass	36	18	13	45	22	2	22	11	3
Orchardgrass	28	14	10	24	12	2	12	6	2
Redtop	36	18	13	30	15	2	15	7	2
Tall Fescue	20	12	6	20	10	2	10	5	1
Timothy	28	14	10	24	12	2	12	6	2
Alfalfa	NA	NA	NA	24	12	3	12	6	3
Birdsfoot trefoil	27	13	10	22	11	3	11	5	3
Ladino clover	27	13	10	22	11	3	11	5	3
Alsike/Red clover	28	14	10	24	12	3	12	6	3
Annual Lespedeza	30	15	11	22	11	3	11	5	3

* Where wildlife is the primary purpose of the planting, use ½ the listed numbers of seedlings.

**Healthy, mature plants will have multiple stems per plant.

STAND EVALUATION

Conservationist_____ Landowner_____
Date_____ Program_____
Practice Name_____Code_____

Plant Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total	Avg.
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TOTAL PER COUNT*																											

Planting Date_____Soil Type(s)_____
Age of seeding_____yrs_____mo   Seeding direction_____
Total acres_____Density of seeded species_____
Plant vigor_____Avg. Plant Height_____
Stand is_____Adequate_____Questionable_____Inadequate
Weed Competition_____
_____
_____
Comments_____
_____
_____
_____
Recommendations to Cooperator_____
_____
_____
_____
_____

*(If more than 25 counts ignore bottom totals)

Guidelines
- sample in a systematic and uniform manner
 - minimum of 10 counts for each 10 acres or less of field size
- avoid areas that may have been double seeded
- sample perpendicular or diagonal to drill rows - use a 1 square
    foot frame (12 in. x 12 in.) - use table on reverse side to
    determine adequacy
- sketch how field was sampled.

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